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Date: February 24, 2003

By

Diana J. Jew
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Response

-- PATENT --

**IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE**

Applicants:	Stephen C. Schulz et al.	Docket No.	35013.5100
Serial No.:	09/812,655	Group Art Unit:	3723
Filed:	March 19, 2001	Examiner:	George Nguyen
Title:	LOW AMPLITUDE, HIGH SPEED POLISHER AND METHOD		

RESPONSE TO OFFICE ACTION

Box RESPONSE-FEE
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Washington, D.C. 20231-0001

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TECHNOLOGY CENTER R3700

Honorable Commissioner:

In response to the Office Action dated October 23, 2002, the period of response for which is hereby extended by one month to February 24, 2003, in that February 23, 2003 falls on a Sunday, please consider the following remarks:

REMARKS

In the October 23, 2003 Office Action, the Examiner rejected claims 1-5, 7, 15-23, 25, 27, and 30 pending in the application. Reconsideration is respectfully considered in light of the remarks that follow.

Claims 1-5, 7, 15-23, 25, 27, and 30 stand rejected under 35 U.S.C. Sec. 103(a) as being unpatentable over Breivogel et al., U.S. Patent No. 5,554,064, issued September 10, 1996 (hereinafter "Breivogel") in view of Rhoades, U.S. Patent No. 5, 187,899, issued February 23, 1993 (hereinafter "Rhoades"). More specifically, the Examiner asserts that Breivogel discloses the claimed invention except for the low amplitude and high frequency vibratory polishing motion set forth in the claims. The Examiner further asserts that Rhoades teaches that it is known in the art to utilize high frequency/low amplitude vibrational polishing in combination with a slurry to obtain a high surface finish polish without the loss of resolution or detail. The Examiner therefore states that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the high frequency/low amplitude vibrational polishing taught by Rhoades since Rhoades states that such a modification would obtain a high surface polish without the loss of resolution or detail (Col. 3, lines 55-61 in Rhoades). Further, with respect to the range of amplitude and high frequency set forth in Applicants' claims, the Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized such a range since it has been held that discovering the optimum or workable ranges involves only routine skill in the art where general conditions of a claim are disclosed in the prior art. Applicants respectfully traverse this rejection.

"Obviousness must be established by consideration of the prior art, as well as the claimed invention, as a whole. The reference must do more than suggest that an innovation 'ought to be tried,' or is obvious in hindsight, it must itself directly suggest the desirability of a new combination." Richdel Division of Garden America Corp. v. Aqua-Trol Corp., 681 F. Supp. 141,145, 7 U.S.P.Q. 2d 1146, 1149 (E.D. N.Y. 1988). Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure. In addition, "in

determining whether such a question can fairly be gleaned from the prior art, the full field of the invention must be considered; for the person of ordinary skill is charged with knowledge of the entire body of technological literature, including that which might lead away from the claimed invention.” In re Dow Chemical Co., 837 F.2d 469, 473, 5 U.S.P.Q. 2d 1529, 1531 (Fed. Cir. 1988).

In discussing the prior art, Rhoades states that ultrasonic polishing is well known in the art with a tool typically vibrating at frequencies within a range of 19,500 to 20,500 hertz with an amplitude of vibration typically within a range of 0.01 to 0.05 mm (See Col. 1, lines 51-64 in Rhoades). With respect to the invention claimed by Rhoades, Rhoades discloses high frequency vibrational polishing without substantial loss of fine resolution and detail using a tool as the oscillating driver of a liquid slurry where the tool is formed from a more ultrasonically abradable material than the workpiece. Rhoades discloses that the polishing process of its invention can be effective at typical frequencies such as the 19 to 22 KHz frequencies referenced in the prior art as well as at frequencies well below that frequency range down to 1 KHz. Rhoades also states that the preferred frequencies are in the range of 10 to 18 KHz (See Col. 5, lines 15-23 in Rhoades). There is no discussion anywhere in Rhoades regarding a change in the amplitude of vibration.

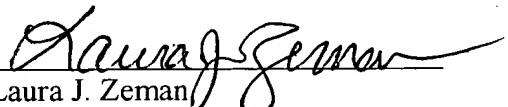
In contrast to Rhoades, Applicants’ claimed invention requires an amplitude of vibration within a range of 0.05 to 2.0 mm which is well above the typical amplitude of vibration disclosed in the prior art. Neither the prior art discussed by Rhoades nor the Rhoades reference itself discloses such a range for the amplitude of vibration. Moreover, additional claims by Applicant include combining a 0.05 to 2.0 mm range of amplitude with a frequency in the range of 2,000 – 10,000 cycles/min (33 – 166 Hertz). Since Rhoades fails to disclose changing the amplitude of

vibration when operating at high frequencies (i.e. frequencies lower than those used for typical ultrasonic polishing), then Rhoades actually teaches away from Applicants' claims. Moreover, Rhoades further teaches away from Applicants claims where the amplitude of vibration is increased in combination with lowering the typical vibratory frequencies even further than those indicated in Rhoades. Accordingly, in that neither Rhoades or Breivogel, either alone or in combination, disclose or suggest all of the limitations of Applicants' claims, then Applicants' claims cannot be obvious in light of Rhoades and Breivogel.

In view of the foregoing, Applicants respectfully submit that all of the pending claims fully comply with 35 U.S.C. Sec. 112 and are allowable over the prior art of record. Reconsideration of the application and allowance of all pending claims is earnestly solicited. Should the Examiner wish to discuss any of the above in greater detail, then the Examiner is invited to telephone the undersigned at the Examiner's convenience.

Dated: February 24, 2003

Respectfully submitted,

By 
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